

ABSTRACT

**MULTI-CARRIER COMMUNICATION SYSTEM WITH SAMPLE RATE PILOT
CARRIER AND TIME DIVISION DUPLEXING FRAME RATE PILOT CARRIER**

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In a multi-carrier communication system wherein data are transferred bi-directionally in a time division duplexed way, a first pilot carrier is used to transfer a sample rate between two transceivers (VDSL_LT, VDSL_NT) and a second pilot carrier is used to transfer a time division duplexing frame rate between the two transceivers (VDSL_LT, VDSL_NT). The first pilot carrier has an instantaneous frequency that is a fraction of the sample rate of the first transceiver (VDSL_LT) and is orthogonal to other carriers used in the multi-carrier communication system. The second pilot carrier has a mean frequency that is a fraction of the time division duplexing frame rate and is also orthogonal to the other carriers used in the multi-carrier communication system. The second pilot carrier is different from the first pilot carrier.